CLAIMS

1. A method of producing a thin layer of semiconductor material from a wafer of said material having a flat face, including an ion implantation step consisting of bombarding said flat face with ions chosen from among the ions of rare gases or of hydrogen, at a specific temperature and a specific dose in order to create, in a plane called a reference plane and situated at a depth proximate to the mean depth of penetration of the ions, microcavities, the method also including a subsequent thermal treatment step at a temperature sufficient to achieve separation of the wafer into two parts, across the reference plane, the part situated on the side of the flat face constituting the thin layer, in which :

- the ion implantation step is carried out with an ion dose between a minimum dose and a maximum dose, the minimum dose being that from which there will be sufficient creation of microcavities to obtain the embrittlement of the wafer along the reference plane, the maximum dose, or critical dose being that above which, during the thermal treatment, there is separation of the wafer,

- a separation step of the wafer into two parts, across the reference plane, is provided after or during the thermal treatment step, this separation step comprising the application of mechanical forces between the two parts of the wafer.

2. A method according to Claim 1, comprising, between the thermal treatment step and the separation step, a step consisting of producing all or part of at least one electronic component in the part of the wafer before forming the thin layer.

3. A method according to Claim 2 in which, the production of said electronic component, requiring

thermal treatment phases, these are carried out at a temperature below that of the thermal treatment.

4. A method according to Claim 1, in which, just before the separation step, an extra step is provided that consists of said wafer, on the side of the flat face, being brought into close contact with and being rigidly fixed to, a support through which the mechanical forces will be applied.

5. A method according to Claim 4, in which said support is a flexible support.

6. A method according to Claim 5, in which said flexible support is a sheet of Kapton(R).

7. A method according to Claim 4 in which said support is a rigid support.

8. A method according to Claim 7, in which said rigid support is a wafer of oxidised silicon.

9. A method according to Claim 1, in which said wafer of semiconductor material is made of monocrystalline silicon.

10. A method according to Claim 1, in which said wafer of semiconductor material is covered on the side of the flat face, with a layer of non-semiconductor material.

11. A method according to Claim 10, in which the non-semiconductor material is a dielectric material.

12. A method according to any one of the preceding Claims, in which the mechanical forces applied at the time of the separation step are tensile forces and/or shear forces and/or bending forces.